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Faculty Teaching Time: A Comparison of Web-Based and Face-to-Face Graduate Nursing Courses

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Abstract

Web-based education brings a new dimension to the issue of measuring faculty workload. Current literature reflects instructor concerns related to the time required to teach web-based courses (McAlpine, Lockerbie, Ramsay & Beaman 2002; Sellani & Harrington, 2002; Smith, Ferguson & Caris, 2001). This descriptive, comparative study seeks to determine the time required to teach web-based graduate nursing courses and compare that to teaching similar courses in the face-to-face setting. Utilizing time records previously collected as part of a federally funded grant, data from 11 web-based and five face-to-face graduate level nursing courses were analyzed. Although a statistically significant difference in teaching time requirements was not demonstrated, several interesting trends did appear. Examples include differences related to preparation time and the division of teacher time while teaching web-based as opposed to face-to-face courses. Future research and continued data collection related to faculty workload and time usage will be needed as web-based courses become a growing part of graduate nursing education.

KEYWORDS: faculty workload, graduate education, nursing, web-based education

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Teaching a web-based course brings a new dimension to the issue of measuring faculty workload. Incorporation of new technologies into existing methods of assessing faculty productivity and accountability may require a change to the current paradigm in order to accurately reflect faculty workload.

Web-based learning options for undergraduate and graduate nursing students have generated much interest over the past decade. The range of nursing education available as web-based or web-assisted reaches from single courses to entire degree programs. Advantages are: student convenience, access for students in rural and other areas distant to the program, increased marketability of programs, and promotion of self directed learning (Baldwin, Walker & Evans 2004; Leasure, Davis & Thievon, 2000; McAlpine, et al., 2002).

Although the advantages of web-based education are clear, the question about how the use of technology impacts faculty workload is unanswered. The ability to predict and measure time expenditures related to teaching web-based courses is needed to aid in future planning and resource allocation. Time utilization may differ for online teaching and it will be important for educators to understand how time is used and how much time is required so that courses are planned in a way that maximizes both faculty effort and student learning. The purpose of this study was to determine the time required for teaching web-based graduate nursing courses compared to traditional face-to-face graduate nursing courses during the semester offered. Utilizing the variable of actual teaching time, measured in time per credit hour, the researchers sought to answer the following questions: What is the time required to teach a web-based graduate level nursing course? Is the time requirement different from that of a face-to-face graduate level nursing course?

BACKGROUND

Faculty productivity and accountability are currently measured in a variety of ways. National benchmarking data, such as the National Study of Postsecondary Faculty (NSOPF), and the American Association of Community Colleges seek, as part of their function, to measure the expenditure of faculty time (Middaugh, 2002; National Center for Educational Statistics, 2002). Faculty effort is primarily focused on direct teaching, research and service to the institution and community (Middaugh; National Center for Educational Statistics). The credit hour is often utilized to measure teaching, generally representing 50 minutes of student contact time weekly (Ehrlich, 2003; Middaugh).

In the U.S., the American Association of Colleges of Nursing (AACN) published a White Paper discussing distance education in nursing and defined distance education as "a set of teaching and/or learning strategies to meet the learning needs of students separate from the traditional classroom setting and sometimes the traditional roles of faculty." (AACN, 1999, ¶ 8). The report, issued in 1999, outlined benefits and concerns related to distance education and included guidelines for the use of distance education methodologies (AACN). As the AACN explored the impact of distance technologies on the education of nurses nationwide, individual nursing programs were examining the effects of online nursing education as that methodology was increasingly becoming the norm.

Researchers have explored student outcomes in web-based nursing courses (Buckley, 2003; Kearns, Shoaf & Summey, 2004; Leasure et al., 2000), compared faculty teaching methods utilized, and student course satisfaction in web-based and traditional courses (Ryan, Carlton & Ali, 1999; Salyers, 2005). Student characteristics, including learning styles and computer skills, have been examined for students enrolled in web-based and face-to-face sections of a graduate nursing course (Salyers). Articles appeared in nursing literature regarding the design of web-based nursing courses (Carlton, Ryan, & Siktberg, 1998; Carr & Farley, 2003; Kaas, Block, Avery, Lindeke, Kubik & Duckett, 2001), development of web-based nursing programs (Kaas, et al.), and a framework for evaluating web-based nursing courses (Billings, 2000). Nursing research contrasting time requirements to teach web-based and face-to-face courses was not found.

There are frequent references in the literature regarding the time required for web-based teaching. Faculty concern related to workload was expressed in the eMBA program at Nova Southeastern University which sought additional compensation and workload considerations for teaching web-based courses. The faculty described online courses as more labor intensive, complex and requiring greater preparation time than traditional courses. Additional time to grade papers and respond to student questions also added to the workload (Sellani & Harrington, 2002). Smith et al. (2002) interviewed 22 college professors who had taught both face-to-face and on the web about their experiences. Increased faculty workload was the third most common theme that emerged during the interviews. The National Center for Educational Statistics (NCES) (2002) analysis of postsecondary faculty reported increased availability of instructors, increased student contacts and an increased teaching load for instructors involved in distance education.

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The nursing literature reflected similar concerns. Instructors of a graduate level nursing ethics course at the University of New Brunswick observed that "dual energy" was required to manage both the issues related to web-based delivery and the course content itself (McAlpine et al., 2002). Nursing faculty at the University of Minnesota reported time management issues related to the increased length of their online responses to students (Kaas et al., 2001). Developing the skill of time management in the web environment was noted as a challenge in redesigning nurse-midwifery and women's health nurse practitioner graduate specialties to web-based (Avery, Ringdahl, Juve & Plumbo, 2003). Faculty workload and the increased time required to respond to students in web-based courses was also noted by researchers studying student response to web-based baccalaureate completion and graduate nursing courses at Ball State University (Ryan et al., 1999). Ryan, Carlton and Ali (2004) identified time management as a major theme during interviews with nursing faculty teaching web-based courses. Communication related activities, such as answering email and reading postings were also noted as labor intensive (Ryan et al., 2004).

Educators addressing the issue of web-based education imply that developing and teaching web-based courses is labor intensive requiring increased faculty time and effort. Yet the actual time required to teach web-based courses is, for the most part, unknown. An extensive review of health science and education literature (Medline, CINAHL, ERIC) yielded only two examples of primary research relate to this question.

Primary research contrasting instruction time in web-based and face-to-face offerings of the same course has been published in education literature. Visser (2000) offered a 12 week graduate public administration course in the face-to-face and in a distance format. He kept daily records during the eight month period of course development and delivery including course development activities (e.g., reading selection, syllabus preparation, preparation of assignments and tests) time required to adapt the course to the web (course web site design, distance education training) and time spent in course delivery. He concluded that while the distance offering (web-based and interactive television) required additional time overall for development and teaching, the delivery of the distance education offering required fewer actual hours then its face-to-face counterpart (84.75 hours compared to 96 hours). This finding was consistent with DiBiase (2000) who contrasted time requirements for teaching and course maintenance of an undergraduate geography course offered both in the classroom and on the web. When course development and web adaptation were removed, the web offering required less instruction time. DiBiase recommended more research testing his

hypothesis that instructor effort per student is relatively constant in a distance course, and declines as student numbers increase in a traditional course.

The focus of the nursing literature was primarily related to student outcomes, student satisfaction and program/course design. This focus is appropriate in that quality must be established prior to intensive exploration of logistics. A limitation of the current research in the area of faculty workload is that references to time requirements are largely anecdotal. The two primary research studies that measured time utilization focused on a single course each and both found that web-based teaching required less time than face-to-face. A larger number of courses, or entire programs of study, must be examined to adequately evaluate time differences in teaching web-based and traditional courses. As DiBiase (2000) suggests, assessing variables such as hours per student will also add to our knowledge base on this topic. More information about faculty workload requirements related to web-based instruction is needed for adequate planning and faculty support.

Billings (2002) proposed a conceptual framework for assessing practices and outcomes in web-based courses in nursing. Relationships were proposed among the concepts of faculty support, student support, educational practices and use of technology and she explained how the concepts may influence each other and ultimately impact student outcomes. For this study, the concept of faculty support was of specific interest. The framework supports the need to accurately measure faculty workload. The ability to measure the impact of web-based instruction on faculty effort will improve workload recognition and ultimately impact student outcome.

METHODOLOGY

This descriptive, comparative study was originally conducted as part of the evaluation of a federally funded grant to develop distance education opportunities for graduate nursing students in a large U.S. Midwestern university. The sample for this study consisted of faculty who were teaching web-based and face-to-face courses. Data were collected over two semesters, the fall of 2002 and the spring of 2003. All nursing faculty teaching web-based graduate nursing courses at the time of the study were invited to participate. Faculty members teaching comparable graduate face-to-face courses were also invited to participate. Courses included core courses such as theory and population focused health, as well as clinical specialty courses including physiology, advanced public health nursing and pharmacology. No instructors were teaching in both methodologies. One faculty member was teaching a face-to-face course for the

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first time, but had an experienced colleague who provided some assistance. All other faculty were experienced in both the course and teaching methodology. Internal Review Board (IRB) approval was obtained.

Participating faculty members were asked to track actual time they spent teaching during the semester. Because new web-based courses require significant preparation in advance, data regarding time spent on course preparation prior to the start of the semester were not collected. Researchers defined four specific activities to classify faculty time expenditure for web-based and face-to-face courses. These were reviewed with several faculty experienced in both web-based and face-to-face teaching for face validity. The categories for web-based courses included 1) interacting with students online (reading postings, answering email), 2) evaluation of students, 3) technical problem solving, and 4) interim courses updates and maintenance. Categories for face-to-face courses included 1) actual time in the classroom, 2) evaluation of students, 3) meetings with students outside of class, and 4) class preparation. Faculty could choose to record teaching time using a pencil and paper tracking tool or Tool Time (1999), a shareware computer program, which allowed the user to "punch in and out" while designating time to selected categories. Time was recorded in minutes. Data reporting was submitted weekly using the paper form or electronically using the share-ware time tool. Data from 11 web-based and five face-to-face courses were utilized for the study.

Participating faculty were contacted weekly with reminders to submit data. Small incentives were used to encourage timely submission of data each week of the semester resulting in complete data for 89% of the weeks for face-to-face courses and 90% of the weeks for web-based courses. One web-based and one face-to-face course had 6 weeks of missing data. Several challenges occurred regarding the use and interpretation of data initially collected. Data were analyzed two years following collection; therefore, when questions arose regarding data, recall over that time period was required for clarification. Excellent instructor record keeping did allow sufficient information to clarify questions in the majority of situations. If clarification was not sufficient, data were deemed incomplete and therefore not utilized. Substantial missing data resulted in the inability to use data from three courses.

Data from 11 web-based and five traditional courses were analyzed separately and comparatively. Information about actual teaching time, recorded in both in minutes and quarter hours, was rounded to the nearest quarter hour. Time less than a quarter hour was rounded up to one quarter hour. The conversion from minutes to quarter hours allowed for inclusion of data recorded in hours and partial hours and eased data entry. Time that was recorded but not assigned to a

category by the instructor was placed in the most similar category determined by the authors based on faculty notes and contacting instructors for further clarification as needed. Next, the time was summed by hours each week for each category for each course and entered into SPSS version 11.0. The number of credit hours assigned to each course was also recorded to allow for the calculation of hours of teaching time per credit.

Descriptive statistics were calculated for web-based and face-to-face courses overall and for each of the four categories of teaching activities including the teaching time per credit hour for both the web-based and face-to-face courses. All face-to-face courses were three graduate credits whereas the web-based courses included two, three and a single four credit course. The mean credit allotment for web-based courses was 2.45. In two instances students could take a course for a variable number of credits. For our analyses, these courses were assigned the number of credits students most commonly registered for.

The Mann-Whitney U test at 95% confidence level was utilized to compare time between web-based and face-to-face courses because of the small data set and inability to determine a normal distribution. One data point was larger than others, but within three standard deviations, and was retained in an effort not to reduce the size of the data set.

The data were described in one additional way. Total teaching time for web-based and face-to-face courses was examined as a percentage of time within each category. This allowed us to examine the different ways in which a teacher's time was utilized in each course type.

RESULTS

A mean of 113 (*SD* = 42.6) hours was required to teach a web-based graduate nursing course. The courses were a mean 2.45 credits each, resulting in a mean actual teaching time of 46.1 (*SD* = 16.7) hours per credit per course. The time required to teach the five face-to-face graduate nursing courses analyzed for this study was a mean of 118.4 (*SD* = 39.5) hours. Face-to-face courses were all three credits resulting in a mean actual teaching time of 39.4 (*SD* = 13.2) hours per credit per course. The division of teaching time in the web-based and face-to-face courses is represented in Tables 1 and 2.

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Table 1

Actual teaching time in hours per credit for web-based courses (N=11)

Category	Mean	SD
Interaction	23.77	14.36
Evaluation	14.23	2.39
Technical issues	2.65	2.39
Course updates	5.45	4.68

Table 2

Actual teaching time in hours per credit for face-to-face taught courses (N=5)

Category	Mean	SD
Class time	14.5	1.89
Evaluation	8.2	3.39
Meetings	1.36	1.64
Preparation	15.38	10.37

There was no significant difference in the hours per credit required to teach a web-based as compared with a face-to-face graduate level nursing course. The mean ranks were 8.64 for the web-based courses and 8.2 for the face-to-face courses (z = -.170, p = .865).

Time utilization was also examined within each course type. The percentage of time for each category for both web-based and face-to-face courses was calculated and these data are shown in Tables 3 and 4.

Table 3

Percentage of teaching time by category for web-based courses

Category	Percentage of teaching time
Student interaction	52
Student evaluation	31
Technical issues	6
Course updates	12

Table 4

Percentage of teaching time by category for face-to-face courses

Category	Percentage of teaching time
Class time	37
Student evaluation	21
Meetings	3
Preparation	39

DISCUSSION

Web-based courses required an average of 46.1 hours per credit per course and face-to-face courses required an average of 39.4 hours per course per credit. The difference was not significant. In addition to examining hours per credit of faculty teaching time, we also described the categories of activities comprising faculty work effort. The largest proportion of time in web-based courses, 52%, was spent interacting with students. Faculty teaching face-to-face courses spent 40% of their time with students including class and any other meeting time. More time was spent in preparation for face-to-face courses (39%) than in updates for web-based courses (12%). This teaching effort was during the semester only and

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did not include any preparation prior to the semester in an effort to examine only the actual work of teaching the courses.

We compared faculty teaching effort between methodologies, but did not gather data related to specific course evaluation strategies such as papers assigned, other written assignments such as discussion postings or case studies, use of multiple choice or essay exams, etc. However, faculty did account for their time evaluating student work for both teaching methodologies. Faculty teaching web-based courses spent 31% of their time evaluating student work; faculty teaching face-to-face spent 21% of their time evaluating students.

With the continued growth of web-based education nursing faculty will benefit from increased insight into the impact of this methodology on faculty workload. Although this study did not find a statistically significant difference in hours per credit required to teach web-based as compared to face-to-face graduate nursing courses, it does raise questions and opportunities for future research. The mean hours per credit reflect a difference of 6.7 hours (web-based courses requiring more time). The difference of essentially a full work day per credit during a semester does represent an increased demand on faculty time if this difference were demonstrated in further research. This finding is different than Visser (2000) and DiBiase (2000) who found that fewer hours were required, after web course development was complete, to teach a single web-based than the same face to face course. Our small sample was a limitation. A post hoc power analysis resulted in a required sample of 65 courses in each group for this difference to be significant.

Review of the data also reflected differences between course credit load. All of the face-to-face courses reviewed were offered for three graduate credits whereas seven of the 11 web-based courses were offered for two graduate credits. This raises additional questions and opportunities. Are two credit courses more easily redesigned for web-based delivery? Are web-based courses weighted differently? Despite an attempt to control for this by reporting data in hours per credit, comparison of equally weighted courses could yield different results. In the future, matching courses for comparison according to credits per course and similar type of course would strengthen the methodology. The ideal comparison would be multiple examples of a face-to-face course and a web-based course taught by the same faculty member. This approach would not be practical in many cases as most graduate nursing programs do not offer multiple sections of many graduate courses each semester or academic year.

Faculty appeared to utilize time differently while teaching by the two methodologies. One striking difference was in the area of course preparation. The faculty in face-to-face courses reported spending 39% of their total time on preparation while the web-based faculty reported only 12% of their total time was spent on course updates (which authors deemed as similar categories). This view of the data allowed differences to emerge presenting opportunities for further research. These data could imply that more preparation for web-based courses is done in advance of the course being taught, although an advantage of web-based teaching is updating materials as new and emerging information becomes available, particularly in clinically focused courses.

Further refinement of the categories of teaching tasks for each teaching methodology should be considered. An increased understanding of how teachers use their time could have implications for workload assignments and related research in the future. Faculty concern over workload (McAlpine et al., 2002; Sellani, 2002) when teaching web-based courses may relate more to the redesign of courses to web-based formats and the preparation required prior to the start of the course than the actual teaching of the course. Future research should include course preparation prior to and during the semester as part of faculty teaching time in order to give a complete picture of instructor effort.

This research also illuminates the issue of student contact time. Instructors of web-based courses report spending 52% of their time with student contact. Faculty teaching face-to-face courses reported spending 37% of their time in class. This difference, along with the unstructured nature of web-based courses, may lead to the feeling of being constantly available (Young, 2002). It may also indicate that students receive more attention from faculty in a web-based course even though they do not see the instructor as much or at all.

The World Wide Web presents an opportunity to provide graduate nursing education to a wider audience and increase overall access. The current emphasis on student outcomes and student related issues, in regard to web-based education, is appropriate and requires on-going attention. Yet, faculty issues are also important as they directly impact the student over time. Billing's (2002) framework was helpful in illustrating and clarifying the important relationship between faculty support and variables such as faculty workload, and outcomes.

Although this study did not demonstrate a statistically significant difference in actual teaching time it did begin to illuminate issues related to course preparation and division of faculty time while teaching a course. Despite the limitations inherent in gathering this kind of data and the small sample, our

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results suggest that the hours of teaching for web-based courses is somewhat similar to face-to-face. We also initiated examination of categories of faculty teaching effort and provided descriptive information to allow a beginning look at how faculty time is used in each teaching methodology. Future research utilizing a larger sample, perhaps partnering across two or more graduate nursing programs, and including advance preparation time will be needed to answer the questions related to the role of course type (web-based versus face-to-face) in teacher workload. Thoughtful planning and continued research will assure not only continued excellence for students but equity and support for faculty.

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